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VI.—*On the supposed Sources of the River Purus, one of the principal Tributaries of the Amazons.*

By C. R. MARKHAM, Esq., F.R.G.S.

Read, March 12, 1855.

ON the 1st of May, 1853, I left the little town of Paucar-tambo, which is 40 miles N.E. from Cuzco, the ancient city of the Incas, with the intention of exploring and collecting information concerning the valleys to the eastward, and, if possible, penetrating to the banks of the Madre de Dios, or Purus.* From the level plains on the summits of the last range of the Andes, where the clouds, charged with particles of ice, roll along the ground, and snow covers the long grass, the road descends rapidly into the Montaña.† In less than half an hour the trees of tropical growth began to rise on either side of the steep zigzag path, the heat became oppressive, torrents of rain fell continuously, while, as the mists at intervals cleared away, hills became visible on every side, clothed with gigantic trees and tangled underwood.

After a journey down the steep path, of three hours' duration, I accomplished the descent, which was 8 miles long, and reached the banks of the torrent of Chiri-mayu, where a little shed had been erected. It was near sunset when I thus found myself at the entrance of the Montaña. The torrent, descending by a splendid waterfall at the side of the path, swept by the little level space where the shed was built, and disappeared almost immediately between the spurs of the hills. From the small amphitheatre thus formed, the hills rise up perpendicularly on every side, covered with tangled brushwood, ferns, and creepers of most brilliant colours; and wherever a projecting point gave room for roots to take hold, the space was occupied by lofty palms and other forest trees. The Chiri-mayu (or cold river) falls into the Tono, one of the tributaries of the Purus. Towards sunset it ceased raining, and the mists clearing away, a scene was presented of unequalled loveliness. The brilliant and varied colours of the foliage and flowers, the splendid butterflies of immense size, and birds of the gaudiest plumage, humming birds shaking the dew-drops from the scarlet salvias, parrots crowding on the upper branches of the trees, with the sparkling fall of the torrent, combined to form a fairy-like scene of surpassing beauty.

* "The passage into these valleys, where the coca grows, is over that high mountain called 'Canacuy,' descending 5 leagues almost perpendicular, which makes a man's head giddy to look down: how much more laboursome must it be to ascend and descend those ways, turning and winding in form of a serpent!"—*G. de la Vega*, b. iv. ch. xvi.

† The tropical valleys and plains to the eastward of the Peruvian Andes are called "*the Montaña*."

After trying in vain to light a fire, I ate some raw chocolate, and, wrapping myself in some mule-cloths, went to sleep. During the night a fearful storm of thunder and lightning burst over the spot, peal followed peal in quick succession, while again the rain fell in torrents.

Next morning, crossing a little bridge over the Chiri-mayu, I continued my journey down a ravine to the eastward, with steep hills rising on either side, and a river of considerable size formed by a junction of the Chiri-mayu and Yana-mayu (or black river), now called the Tono, dashing along at some distance below the path. For some leagues the way continued to lead down narrow ravines, the sides of which were covered with underwood. Tree ferns, palms, and enormous forest trees clothed the mountains up to their summits; masses of clouds rolled down the sides of the ravines, keeping the foliage continually wet; and here and there a beautiful cascade dashed foaming down into the Tono.

On a little level space, 7 miles from the hut on the Chiri-mayu, the forest had been cleared away, and the small farm of "La Cueva" established. Don Ramon Ordoñez, the proprietor, fearful of the inroads of the Chunchos Indians, had retreated from the vast plains farther E., and established himself in the ravine, whence escape to the mountains was easy. His property consisted only of a hut with two rooms, about a dozen Inca Indians from the neighbourhood of Cuzco, two fields of coca, and one of pine-apples.

About a league farther to the eastward the hills gradually sink lower, and at last merge into one vast plain covered with forest, which stretches away almost to the horizon. At this point the "Pitama" unites with the Tono, and forms one large river; and the path enters the plains or valleys of Paucar-tambo, leading through a dense and tangled forest, with the river Tono a few yards on the left-hand side.

Twenty miles through the forest, in an easterly direction, brings the traveller to the farm of San Miguel, the last settlement in this part of Peru—the extreme point to which civilisation has yet reached. The way leads through all the beautiful vegetation of the torrid zone. On either side grow the tallest and most graceful palms, tree ferns, balsam trees, India-rubber trees, and many others of enormous growth; while the underwood consists of creepers bearing flowers of every shape and colour, and thickets of bamboo, with their larger joints 6 inches in diameter, which in many places were broken, and hung across the road in dense masses, rendering it almost impassable.

Six small rivers * fall into the Tono, intersecting the road, and

* Malci-mayu, Lucu-mayu, San Juan, Yanatay, Carachi-mayu, Uisiray.

the view up their courses, when crossing them, bordered by the tangled forest on either side, is very striking. The tall stately palms and spreading forest trees formed a dark vista, with the noisy streams dashing over the rocks at their feet, and numbers of birds of every size and colour flew to and fro, from the large wild turkey and green parrot to the brilliant little humming-bird. On the banks of one of these rivers I saw at a distance a great heavy tapir, standing partly in the water, and apparently meditating profoundly. Beyond the last of these tributaries the path ascends a steep cliff overhanging the river Tono, called the Balcon-pata, whence there is an extensive view, with the spurs of the Andes partly hidden in clouds to the westward, and a range of hills to the N.E., but in every other direction a dense forest stretched away to the horizon.

A mile farther on, travelling along rather higher ground, I reached the remains of the two farms of Huayna-pata and Santa Cruz.* The former was attacked a few years ago by the savage Chunchos, and every individual belonging to it was murdered; the latter has been deserted by its occupants, who dreaded a similar fate. Large neglected fields of coca, and plantations of cocoa and bananas, were rapidly becoming choked and overrun by the encroaching forest, and presented the melancholy spectacle of the retreat of civilisation before the returning tide of savage life. In a few years large trees will have grown up in every direction, and no traces will be left of these once flourishing estates.

A few miles to the eastward of this desolate scene is the farm of San Miguel,† which I reached in the evening of the 6th of May, 1853. San Miguel, one of the extreme outworks of civilisation in South America, consists of a number of huts forming three sides, and a long wooden building forming the fourth side of a square, which is planted with orange and citron trees. It is situated on high ground, comparatively free from mosquitos, near the banks of the river Tono, with a few fields of coca attached to it, but otherwise surrounded by the forest. The inhabitants consisted of the "Administrador," Don Pedro Gil, a native of Cuzco; a Piedmontese Carmelite friar, by name Bobo de Revello, who had been there about three years; and a few Indians from Cuzco. The long building forming one side of the square was the dwelling-house of Don Pedro and the friar. Its furniture consisted of a long table, rough benches, and bed places in the walls, like berths on board ship. They were living in a most wretched state of discomfort, without candles or any substitute for them, except two lumps of fat, used by the friar to say mass with; and their food

* Belonging formerly, the one to Don Bernardino Toledo, the other to Dr. Caseris, the priest of Sicuani.

† Belonging to Don Anselmo Mellen.

consisted entirely of chuños, or potatoes soaked in water, and then pressed and frozen on the elevated plains of the Andes. They form, with a little fruit, the staple food of the people of these farms.

The soil in the valleys is so productive that four harvests of coca leaves are yielded annually, which sells at Cuzco for 4 or 5 dollars the arroba. San Miguel produces about 3000 arrobas * of coca a year, and a small quantity of cocoa and fruits, which are sent up periodically to Paucar-tambo on mules, and there sold. The outlay consists of the freight of mules at 3 dollars a journey, and the pay of the Indians 2 rials † a day, and when digging or clearing 3 rials. While working in the coca fields, they constantly keep one or two men armed with muskets as a security against a sudden attack of the Chunchos.

At San Miguel also there is an establishment for collecting India-rubber, belonging to Don Manuel Ugalde, an enterprising young Quiteño artist, living at Cuzco. It consists of eight or nine Indians, who go out weekly into the forests and search for the India-rubber tree. They usually return with several “ypas” or joints of bamboo, about 3 feet high and 4 inches in diameter, filled with the juice.

About a mile from San Miguel, and nearer the Tono, was the farm of Chaupi-mayu,‡ in a ruinous and dilapidated condition, and probably by this time either deserted or destroyed by the Chunchos.

To the S., about 12 miles from San Miguel, near a river of the same name, is the farm of Cosni-pata,§ the most flourishing of the three. It produces, besides coca, cocoa, and maize, about 120 quintals || of rice, which sells at Cuzco for 3 dollars the arroba. This estate employs more labourers, and is altogether in a much more efficient condition, than the others.

These three estates of San Miguel, Chaupi-mayu, and Cosni-pata ¶ alone remain of all those which flourished in the time of Spanish power in the valleys of Paucar-tambo: one by one they have disappeared, either through the attacks and ravages of the Chunchos or the impoverishment of their owners, consequent on the continual disturbances in Peru since the independence; and a dense forest, the abode only of the savage jaguar, ounce, and peccary, and the still more savage Chunchos, covers with rank vegetation the once cultivated and fertile plains—a sad example of ruin and desolation consequent on the absence of a race of men

* 1 arroba = 25 lbs.

† 1 rial = sixpence.

‡ Belonging to Miss Ampuero; agent, Dr. Alvarez.

§ Belonging to Dr. Calderon of Cuzco.

|| 1 quintal = 100 lbs.

¶ The three estates produce together about 8000 arrobas of coca yearly.

capable of successfully combating the difficulties of the country and the inroads of the wild Indians.

The Chunchos, or savage aborigines, of these valleys, lead a wandering life, and are thinly scattered over a wide extent of country. In the neighbourhood of the farms there are two tribes of them, one called the Huachipayris, inhabiting the banks of the river Cosni-pata, and the other the Tuyuneris, wandering along the banks of the Tono and Piña-piña. They are fierce, cruel, and untameable. Hating every stranger to the death, they wander about through the dense forest by tracks impassable and unknown to any one but themselves, perfectly naked, and armed with bows and arrows. Their arrows are of two kinds, one made of hard wood of the chonta-palm, and jagged like a saw, the other pointed with a piece of bamboo, which is very neatly secured to the shaft by a fine twine, and the feathers, fixed spirally into the arrow, are usually chosen from birds of the gaudiest plumage. Little more is known of the habits, and next to nothing of the language and religious ideas,* of these savages. They live, many families together, in a long hut, in shape like the roof of a house, and generally have a small plantation of bananas cleared away near it. Their food consists of bananas, birds, and fish, which they kill with their bows and arrows: the ypa, or joint of the bamboo, serving them as a utensil for all culinary purposes. They are also said to eat the monkeys which abound in the forests. The treatment of their women is said to be brutal and unfeeling, and almost induces a belief in the truth of those reports, which are current among many of the Indian tribes on the Amazons and its tributaries, concerning a race of female warriors who had fled from the tyranny of man.

Father Bobo de Revello has as yet been quite unsuccessful in his attempts to hold any communication with the Chunchos, and has therefore been forced to confine his sphere of usefulness to the inhabitants of the farms.

In 1850 he started on an expedition to discover the great river Purus. Crossing the Tono near San Miguel, the Crescenti, and the Piña-piña, large rivers which fall into the Tono, he ascended a range of hills, whence he had a glorious view of the great river of which he was in search, flowing on silently to the Amazons. Here his provisions failed him, having lived for some days on wild bananas, and he returned to San Miguel.

Father Revello, who is an enthusiastic explorer, has published a pamphlet called ‘*El brillante Porvenir del Cuzco*,’† in which

* They were said by the old Spanish chroniclers to worship jaguars and serpents.

† ‘A glorious Future for Cuzco.’

he shows that the great river he saw was identical with the Purus, and points out the splendid destiny which its navigation may some day open for Cuzco and the whole interior of Peru.

In June, 1852, another exploring expedition was equipped by the young men of Paucar-tambo, headed by Don Manuel Ugalde. They embarked on the river Tono, near San Miguel, in two India-rubber boats, and commenced its descent. The expedition, however, came to a sudden and premature conclusion; for at the point where the three great rivers of Tono, Piña-piña, and Cosni-pata unite, and form the Madre de Dios, the stream is very rapid, and the banks steep and rocky; and here, through some mismanagement, both the boats were capsized, and the inexperienced adventurers with difficulty escaped to the shore, abandoning all idea of continuing their voyage.

In the same year, Lieut. Gibbon, who, under the orders of Lieut. Herndon, was commissioned by the Government of the United States to explore the upper tributaries of the Amazons, penetrated into the valleys of Paucar-tambo and reached the banks of the Cosni-pata; but here, the difficulties opposed to his progress becoming insurmountable, he retraced his steps, and eventually descended the Beni and Madeira to the Amazons.

While at San Miguel I received much information concerning all that is known of these countries from Father Revello, and journeyed with him for some distance to the eastward of that farm. At a place about 2 miles from it, which he had called La Constancia, on the banks of a small tributary of the Tono, he had cleared away a space of ground and planted yucas and other vegetables. This was the scene of the last murder committed by the Chunchos, on a young monk from Cuzco, the companion of Revello. The latter had returned one evening in April, 1853, to San Miguel, leaving his companion at La Constancia. To his surprise the young man did not return that night, and the next morning Revello found his body pierced with nine arrows, one of them actually passing from one rib through his chest and out at the other side.*

These murders are of frequent occurrence, committed, apparently, out of mere wantonness, for the bodies are never robbed. Suddenly a shower of arrows flies from among the trees, and the wretched traveller or muleteer is transfixed, without even seeing his cruel and cowardly assailant.

I reached a hill beyond Constancia after a struggling and tedious journey through the dense forest, whence I obtained a view of the Madre de Dios; and this was the extreme point of my journey. The latitude I found to be $12^{\circ} 45'$ S., and the longitude

* These nine arrows were kindly given to me.

is about $70^{\circ} 30' W.$, 103 miles from Cuzco, and 740 from the mouth of the Purus. Near this point the Tono, with all its tributaries from the W., the Cosni-pata from the S.W., and the Piña-piña from the N., having drained the wide forests of Paucartambo, unite and form that mighty river which I saw from a distance, and which is here called the Madre de Dios, or Amaru-mayu river, evidently the same as the Purus.

About 100 miles farther down, the Purus is supposed to receive as tributaries the two great rivers of Arasa or Marcapata, and Ynambari; the latter draining the rich and extensive province of Carabaya, famous for its gold-washings, and for producing the best known quality of Peruvian bark.

Several facts tend to authorise the belief that the Purus has no great obstructions or rapids, as is the case with the Madeira and other tributaries of the Amazons; foremost of which may be urged its distance from the Andes on one side, and from the mountains of Brazil on the other, and the immense size of its tributaries.

The Purus empties itself into the Amazons by four mouths,* at a point where the visible breadth of that queen of rivers is nearly 3 leagues. These mouths are called, respectively, the Foro† de Camara, de San Thome, and de Cuiuana; and the most easterly one, which is the principal mouth, Smythe judges to be $\frac{1}{2}$ a mile wide.‡ Here the French geographer Condamine, in 1745, sounded in 103 fathoms (no bottom); and Smythe found the depth of the Amazons about this point, and from Coari to Barra, to be 25 fathoms.§ The base of the delta of the Purus, or the distance from the most westerly to the most easterly mouth, is not less than 86 miles.

Such is a brief account of all that is known of this great river, the principal affluents of which, and the beautiful country through which they flow, I had the pleasure of exploring in the May of last year.

It is impossible to believe that the magnificent river system of South America is for ever destined to remain useless—the abode merely of the untamed savage and fierce jaguar. If once the Madre de Dios or Purus was thoroughly explored, the effects it would have on the industry and future prospects of Peru are incalculable. The people of the interior of that beautiful country,

* The smaller mouths are only navigable at high water in small canoes.

† Foro means a bar.

‡ Herndon gives the breadth at $\frac{3}{4}$ of a mile.

§ Herndon gives the depth, one mile up the river, at 18 fathoms, and at the mouth 16 fathoms; while the depth, at the same place, in the Amazons, was 23 fathoms. The current in the Purus, he says, was sluggish, running about $\frac{3}{4}$ of a mile per hour.—p. 265.

The shores of the mouth of the Purus are bold, and marked by bushes growing in the water.

the ancient empire of the Incas, would at length succeed in turning the granite barrier of the Andes; a port might be established near Paucar-tambo, and another at the mouth of the Purus; an inland navigation would waft the varied productions of the interior of Peru—its bark, sarsaparilla, copaiba, and India-rubber—its sugar, cocoa, cotton, and tobacco—its alpaca wool, silver, and precious stones—by a direct and easy route to the Old World, and the dangerous journeys across the Cordilleras and long and tedious voyages round Cape Horn would be avoided.

Already the enterprising spirits of the New World are turning their attention to this important subject. Treaties for the navigation of the Amazons, and the exploration of its affluents, have been entered into between the Governments of Peru and the Brazils; and a monopoly of the navigation has been granted, for thirty years, to an eminent Brazilian named De Souza, who already runs four steamers up and down the Amazons from Barra, near the mouths of the Purus, to Pará.*

NOTE.—Sixty years ago Haenke drew attention to the future importance of the Purus, the sources of which, from information derived from the Indians, he was then enabled to fix between the Cordillera of Vilcañota and the east of the mountains of Carabaya—very much where Mr. Markham has laid them down.—See *Journal Royal Geographical Society*, Vol. V., p. 90. See also a paper by Lieut. Smyth, R.N., in Vol. VI. p. 11, &c., and one by Gen. Miller in the same volume, p. 174.—ED.

VII.—*Abstract of a Report made by Dr. R. A. PHILIPPI to the Government of Chile, of a Journey into the Desert of Atacama in 1853-54.*

Communicated by WILLIAM BOLLAERT, Esq., F.R.G.S.

Read, June 11th, 1855.

IN compliance with the Government decree of 10th November, 1853, confiding to me the exploration of the Desert of Atacama, I embarked in the schooner 'Janqueo' with M. Wm. Döll, my assistant, and two servants. We anchored on the 30th in the port of Caldera, whence I went to Copiapo, with the object of procuring all possible information about the Desert. The Intendente called together Messrs. Melendez, Tirapequi, Aranjó, and Almeida: the last had made the journey to Atacama some twenty-three years ago; he had formerly worked mines at various places on the coast, and had recently come from the Valley of Encantada, 60 leagues N. of Copiapo, and he decided upon accompanying us, although he was of an advanced age. The 7th December we

* The Government of Brazil guarantees him a bonus of \$100,000, which grant will probably prevent competition.

Sketch of a Route from
C U Z C O
to the supposed Sources of the
R I V E R P U R U S
to illustrate a Paper
By C. R. Markham Esq^r.

